A.P. GREEN INDUSTRIES, INC.

HEALTH AND SAFETY WORK PRACTICES FOR RCF

MAY 1996

Recommended health and safety work practices for installation and removal of ceramic fiber refractory products:

INSTALLATION

- Use a half mask, air purifying respirator equipped with high efficiency filters which are NIOSH approved for protection against pneumoconiosis producing dust. We recommend use of a respirator at any level of exposure. Employees using a respirator must be fit tested, using the OSHA qualitative fit testing requirements.

- Wear long sleeved, loose fitting clothes, eye protection and avoid wearing tight fitting gloves.

- Wash all exposed areas gently with soap and warm water after handling or other contact with the product.

- Wash work clothes separately from other clothing and rinse washing machine thoroughly after use. Work clothes should not be worn home, change clothes at the job site.

- Employees should not be allowed to smoke in areas where ceramic fibers are being installed. Employees should be encouraged to stop smoking.

- Each employee should be advised of the location of refractory ceramic fiber information. Company material safety data sheets (MSDS's) or generic MSDS's are acceptable for most applications.

- Dustless methods of cleaning such as wet vacuuming or washing down with water should be used. Cleaning with compressed air or dry sweeping should be prohibited. Light dust may be swept using dust suppressant sweeping compounds.

- Prior to installation of ceramic fibers, each employee should be appraised of the possible hazards, conditions and precautions for safe handling.

REMOVAL

- Ceramic fibers, as supplied, do not contain cristobalite, however, when exposed to temperatures above 1800°F (982°C) a large percentage of this material turns to cristobalite. To avoid breathing refractory dust during tear-out, a NIOSH approved respirator should be used.

- Use a half mask, purifying respirator equipped with high efficiency filters which are NIOSH approved for protection against pneumoconiosis producing dust. We recommend use of a respirator at any level of exposure. Employees using a respirator must be fit tested, using the OSHA qualitative fit testing requirements.

- Wear long sleeved, loose fitting clothes, eye protection and avoid wearing tight fitting gloves.

- Wash all exposed areas gently with soap and water after handling or other contact with the product.

- Wash work clothes separately from other clothing and rinse washing machine thoroughly after use. Work clothes should not be worn home, change clothes at the job site.

- Employees should not be permitted to smoke in the area where ceramic fibers are being removed. Employees should be encouraged to stop smoking.

- During removal or repair, the material being removed or the area repaired should be sprayed with water--preferably water containing a wetting agent (detergent)--to suppress dusting.

- Dust collection apparatus should be used.

- Protective clothing designed to minimize significant dust retention should be used and vacuum cleaned prior to removal. Use of cotton and wool clothes which tend to retain dust should be avoided.

- Dustless methods of cleaning such as wet vacuuming or washing down with water should be used. Cleaning with compressed air or dry sweeping should be prohibited. Light dust may be swept using dust suppressing sweeping compounds.

- Prior to removal, each employee should be appraised of the possible hazards, conditions and precautions for safe handling.

- Each employee should be advised of the location of such information. Company material safety data sheets (MSDS's) or generic MSDS's are acceptable for most applications.

GENERAL HEALTH RELATED INFORMATION ON CERAMIC FIBERS

- A.P. Green Industries fibers are manufactured under highly controlled conditions from molten masses of raw materials such as alumina/silica or alumina/silica/zircon.

- A.P. Green Industries believes that our ceramic fibers are safe to manufacture, install, and remove when our recommended safe work practices are followed. These practices are spelled out in our Material Safety Data Sheets and in our recommended health/safety work practice literature.

- At the present time, there is no one federal standard set up to cover the manufacturing, installation, processing, or removal of ceramic fibers; however, general government standards apply to ceramic fibers like any other potential hazardous material.

- Until OSHA (Occupational Safety & Health Administration) or NIOSH (National Institute Occupational Safety & Health) sets a standard for ceramic fibers, A.P. Green Industries has recommended a workplace exposure level of not more than 1 fiber per cubic centimeter.

- The International Agency for Research on Cancer (IARC) provides the following classification in regard to the carcinogenicity of substances:

  Category 1: Sufficient evidence of human carcinogenicity
  Category 2A: Probably carcinogenic to humans
  Category 2B: Possibly carcinogenic to humans
  Category 3: Not Classifiable as to human carcinogenicity
  Category 4: Probably not carcinogenic to humans

- The International Agency for Research on Cancer (IARC) has made the following classifications on ceramic fiber and cristobalite:

  Category 2A: Cristobalite - Probably carcinogenic to humans
  Category 2B: Ceramic fibers - Possibly carcinogenic to humans

- Cristobalite is a form of crystalline silica which can be formed in ceramic fibers when exposed to elevated temperatures above 1800°F. (982°C). Cristobalite is a form of crystalline silica that can cause respiratory disease.

- As of this date, the following information is felt to be accurate on the effects of overexposure to ceramic fibers.

1. Eyes
   a. Acute - causes mechanical irritation
   b. Chronic - none known

2. Skin
   a. Acute - may cause skin irritation in some individuals
   b. Chronic - none known

3. Inhalation
   a. Acute - may cause upper respiratory irritation
   b. Chronic - may cause lung damage. After IARC reviewed all published information relative to man made mineral fibers in 1987, ceramic fibers along with all man-made mineral fibers were classified by IARC as a category 2B--possibly carcinogenic to humans. IARC's classification was based on reports pertaining only to animal exposure.
   c. Pulmonary morbidity study - the pulmonary morbidity study being conducted by the University of Cincinnati indicates that there is a relationship between a long duration of employment in R.C.F. manufacturing facility and pleural plaques (shadows along the inside of the chest wall). The investigators are conducting additional research to determine how other factors such as if the decline in lung function is of any clinical significance among current smokers who showed a decline in pulmonary function values as RCF exposures increased.

4. Ingestion
   a. Acute - unknown
   b. Chronic - unknown

FOR RCF
WARNING

CAS. NO. 142844-00-6

This product contains ceramic fiber, which has been classified as a possible carcinogen. Breathing fiber can cause lung injury and exposure to fiber might cause skin or eye irritation.

The following precautionary practices should be followed:

Minimize airborne fibers. Use a NIOSH approved respirator. Respirator must be fit tested, following OSHA requirements.

Wear long sleeved, loose fitting clothing, gloves and eye protection.

Wash all exposed skin areas gently with soap and warm water after contact with this product. Change clothes at job site.

Wash work clothing separately and rinse washing machine after use.

If this product has been in service at temperatures above 1800°F (982°C) cristobalite (a form of silica) will be present, which can cause a serious lung injury. See MSDS for specific precautionary procedures.

DO NOT INGEST. If this happens, call a physician.

For additional information, see the Material Safety Data Sheet.

KEEP OUT OF REACH OF CHILDREN.

Hazardous ingredient information -- 573-473-3626.

DO NOT USE THIS PRODUCT UNTIL YOU HAVE READ THE MSDS AND THE RECOMMENDED HEALTH AND SAFETY PRACTICES.

A.P. GREEN INDUSTRIES, INC.
Mexico, Missouri 65265 NO. 8R-5